

ABSTRACT OF THE DISCLOSURE

Methods and apparatuses for assembling a structure onto a substrate. A method according to one aspect of the invention includes dispensing a slurry onto a substrate wherein the slurry includes a first plurality of elements, each of which is  
5 designed to mate with a receptor region on said substrate and each of which comprises a functional element, and wherein the slurry also includes a second plurality of elements which are not designed to mate with receptor regions on the substrate. Typically, these second plurality of elements help movement of the first plurality of elements. A method according to another aspect of the invention includes dispensing  
10 in a flow having a first direction a slurry onto a substrate, wherein the slurry includes a fluid and a plurality of elements, each of which is designed to mate with a receptor region on the substrate and each of which includes a functional element, and vibrating substrate in a second direction which is substantially perpendicular to the first direction. A method according to another aspect of the invention includes creating a  
15 slurry comprising of fluid and a plurality of elements, each of which is designed to mate with a receptor region on the substrate and each of which comprises a functional element, and projecting the slurry through a nozzle toward the substrate. In one particular implementation of this aspect, additional nozzles may be used to provide suction or additional fluid or additional slurry. A method according to another aspect  
20 of the invention includes dissolving a bonding agent into a solvent to create a fluid, dispensing a slurry onto a substrate, wherein the slurry includes the fluid and a plurality of elements each of which is designed to mate with a receptor region on the substrate and each of which comprises a functional element, and evaporating the

solvent after each of the plurality of elements has mated with a corresponding receptor, wherein the bonding agent bonds each of the plurality of elements to the corresponding receptor region.